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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/886,636	06/21/2001	Arihiro Takeda	0941.65640	6148

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EXAMINER

AKKAPEDDI, PRASAD R

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 02/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/886,636

Applicant(s)

TAKEDA ET AL.

Examiner

Prasad R Akkapeddi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-16 and 18-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-16 and 18-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 030403. 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/10/2003 has been entered.

Drawings

2. The drawings filed on 09/02/2003 are acceptable subject to correction of the informalities indicated on the attached "Notice of Draftsperson's Patent Drawing Review," PTO-948. In order to avoid abandonment of this application, correction is required in reply to the Office action. The correction will not be held in abeyance.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 4, 5, 16, 18, 20, 21 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Konovalov et al. (Konovalov) (SID, Society of Information Display, May 17-22, 1998, P.1127).

As to claim 1: Konovalov discloses a liquid crystal display device with a pair of substrates having electrodes, a liquid crystal layer sealed between the substrates (Fig. 1). Konovalov also discloses an insulating layer having a plurality of patterns with a dielectric constant different from the dielectric constant of the surrounding are (page 1128, col. 2, lines 31-33) and the variation of the electric field orientation in a pixel region (Fig. 1) (Page 1127, col. 1, last paragraph).

As to the limitation 'controlling an in-plane direction of the liquid crystal molecules when a voltage is applied across the electrodes', Konovalov teaches in (page 1, col. 2, lines 1-8) that the dielectric ribs deposited across the electrode area is different from the longitudinal component of the dielectric susceptibility of the liquid crystal and due to this, after applying electric field to the opposite electrodes the component of the field parallel to the electrodes arises. This component governs the direction of the molecular inclination under electric field. Since the field is parallel to the electrodes, it is an 'in-plane field' and thus controls the in-plane direction of the liquid crystal molecules.

As to claim 4: Konovalov discloses the formation of a photoresist on the substrates (page 1128, col. 2, lines 29-31) and patterning the photoresist layer to form the staggered state as shown in Fig. 1.

As to claim 5: Konovalov discloses a vertical alignment layer (page 1128, col. 2, line 34) and that the liquid crystal is a nematic liquid crystal with a negative dielectric constant (page 1127, col. 2, line 11).

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As to claim 16: Konovalov discloses the plurality of insulating layers are independent of one another (Fig. 1).

As to claims 18 and 20: Konovalov discloses patterned and the independent nature of the insulating layer (photoresist layer).

As to claim 21 and 27: Konovalov discloses electrodes in the absence of slits and the substrates are transparent (due to the absence of any reflector in the bottom substrate in Fig. 1).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3, 6-15, 19 and 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Konovalov in view of Hisatake et al. (Hisatake) (U.S. Patent No. 5,434,690).

As to claims 3: Although Konovalov discloses the formation of a photoresist layer and patterning it to form the insulating patterns, Konovalov does not explicitly disclose that the insulating patterns are connected with each other by an insulating film and that the thickness of the insulating patterns is different from the thickness of the insulating layer.

Hisatake in disclosing a liquid crystal display discloses insulating patterns (22) on the two substrates that are connected with each other by an insulating

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film (17) and the thickness of the insulating patterns different from the insulating film (Fig. 30). Please note the electric field patterns as shown in Fig. 30 that are similar to Konovalov.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the insulating patterns and the film disclosed by Hisatake to the device of Konovalov for providing a display that is capable of widening the angle of viewing field and to enhance the transmittance and increase the response speed while being driven at low driving voltages (col. 3, lines 36-43).

As to claims 6-15: Konovalov does not explicitly disclose the electrode thickness, or the insulating layer being formed on only one substrate, or the positive dielectric constant of the liquid crystal, or the rubbing, or the electrical resistances and impedances, or the metal electrode, or the striped and zigzag nature of the insulating layer.

Hisatake discloses the insulating layer on only one substrate (Fig. 31A), the electrode is narrower than the insulating layer, a nematic liquid crystal with a positive dielectric constant (col. 5, lines 55-57), rubbing treatment of the alignment layers (col. 10, lines 41-44), the insulating layer is made from either RTZ-206 or RTZ-606 (col. 27, lines 1-63) having a refractive index of 1.9 and the liquid crystal material is ZLI-3926 with an added chiral agent (S-811) (col. 23, lines 26-31). Since the two materials are different, the electrical resistance and the impedance of the two materials will also be different as recited in instant

claims 9 and 12. Hisatake also discloses the connection of the insulating patterns with an insulating film (Fig. 30), conductive electrodes, the alignment layers (15 and 16) having a different thickness than the insulating layers (17 and 18) (Figs. 18, 30, 31A), plurality of stripes and the zigzag nature of the stripes (Figs. 25A and 25B), as recited in instant claims 13-15.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the insulating patterns and the film disclosed by Hisatake to the device of Konovalov for providing a display that is capable of widening the angle of viewing field and to enhance the transmittance and increase the response speed while being driven at low driving voltages (col. 3, lines 36-43).

As to claims 19, and 22-26: Konovalov does not disclose the slits in the insulating layer, nor the insulating layer provided on only one of the electrodes.

Hisatake discloses the slits in the insulating layer (Figs. 25-26), the arrangement with respect to the pixel area (col. 5, lines 23-40), insulating layer on the both the electrodes (Fig. 30), patterned nature of the insulating layer on the electrodes (figs. 1 and 30).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the insulating patterns and the film disclosed by Hisatake to the device of Konovalov for providing a display that is capable of widening the angle of viewing field and to enhance the

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transmittance and increase the response speed while being driven at low driving voltages (col. 3, lines 36-43).

Response to Arguments

7. Applicant's arguments, see Remarks, filed 11/10/2003, with respect to the rejection(s) of claim(s) 1 under 35 U.S.C. 103 (a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Konovalov and Hisatake.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prasad R Akkapeddi whose telephone number is 703-305-4767. The examiner can normally be reached on 7:00AM to 5:30PM M-Th.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on 703-305-3492. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0530.

Prasad R Akkapeddi, Ph.D
Examiner
Art Unit 2871

BRA


ROBERT H. KIM
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